

Supplement

Movie S1. Molecular modelling of CYP2J19 from the house finch. A movie showing the molecular model of CYP2J19, following the representation show in Fig 2 panel D, followed by Fig. S2.

Supplemental modelling coordinates. A Pymol session file containing the molecular models for CYP2J19 model generated using rosetta (obj. name = rosetta) and ITASSER (obj. name = model1), the tunnels predicted in these structures using Caver (obj. name plus tunnel number designation), the structures of P450s solved with substrates (named corresponding to PDB ID) used to determine likely substrate binding sites and the structure of 3'-hydroxyechinenone (available on dryad <https://doi.org/10.5061/dryad.f0kr74v>).

Table S1. Means, 95% confidence intervals, full multiple regression and backward stepwise regression results. Hue as dependent variable and parameters below as independent variables. RCR: respiratory control ratio; MMP: mitochondrial membrane potential; 4-HNE: 4-Hydroxynonenal; PGC-1 α : Peroxisome proliferator-activated receptor gamma coactivator 1 α . The value for hue is higher for yellow birds than red (see figure 3). Thus, a negative coefficient indicates a positive relationship between the variable and redness.

	\bar{X}	95% CI	Full multiple regression			Backward-regression		
			β	t	P	β	t	P
Overall model results			---	4.52	0.003	---	10.6	<0.001
Complex I substrates								
state 2 (nmol O ₂ /mg protein/min)	12.59	11.10-14.08	0.563	1.99	0.065	0.43	4.38	0.048
state 3 (nmol O ₂ /mg protein/min)	68.01	62.32-73.70	-0.023	-0.23	0.823	---	---	---
state 4 (nmol O ₂ /mg protein/min)	20.22	16.79-23.66	-0.204	-0.73	0.479	-0.35	7.26	0.013
RCR (state 3/state 4 respiration)	3.803	3.351-4.254	-4.66	-2.81	0.013	-4.44	19.3	<0.001
MMP (relative fluorescence)	400.2	376.7-423.8	-0.036	-2.41	0.029	-0.02	4.30	0.049
Complex II substrate								
state 2 (nmol O ₂ /mg protein/min)	29.60	23.60-32.61	0.127	0.69	0.503	---	---	---
state 3 (nmol O ₂ /mg protein/min)	109.9	101.4-118.5	0.099	0.97	0.348	---	---	---
state 4 (nmol O ₂ /mg protein/min)	35.29	30.48-40.10	-0.381	-1.47	0.163	---	---	---
RCR (state 3/state 4 respiration)	3.395	3.013-3.778	-2.651	-1.11	0.284	---	---	---
MMP (relative fluorescence)	282.5	260.7-304.3	0.004	0.14	0.893	---	---	---
ROS, Oxidative damage, and Biogenesis								
H ₂ O ₂ (nmol/min/mg protein)	6.694	5.212-8.176	-0.009	-0.84	0.412	---	---	---
4-HNE adducts (arbitrary units)	0.822	0.673-0.970	-5.553	-2.34	0.034	-5.97	8.45	0.008
Protein Carbonyl (arbitrary units)	1.414	1.196-1.632	-0.557	-0.27	0.792	---	---	---
PGC-1 α (arbitrary units)	0.069	0.061-0.076	149.1	2.50	0.024	200.0	19.1	<0.001
Citrate Synthase (nmol/min/mg protein)	803.1	743.2-863.1	6385	1.08	0.296	---	---	---